

ABSTRACT OF THE DISCLOSURE

The present invention is a hybrid system for generating power from hydrocarbon and alcohol fuels using a two-stage process to achieve high overall energy conversion efficiency. The first stage is a reformer and fuel cell

5 subsystem that uses an internal combustion engine operated at an air/fuel ratio richer than stoichiometric as a partial oxidation reformer for commonly available liquid or gaseous hydrocarbon or alcohol fuels. The engine produces shaft power and a product gas mixture containing hydrogen, carbon monoxide, and traces of light hydrocarbons that is used as fuel in fuel cells to generate electric

10 power. The second stage is a heat engine subsystem that captures heat from the reformer and fuel cell subsystem, and produces additional shaft power. In addition to efficiency, advantages include adaptability to a variety of fuels, quick system startup with immediate shaft power availability, and low emission of pollutantants.